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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/775,835	01/31/2001	Woo Sik Yoo	M-8250 US	1153

7590 04/04/2002

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EXAMINER

KILDAY, LISA A

ART UNIT	PAPER NUMBER
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2829

DATE MAILED: 04/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/775,835

Applicant(s)

YOO, WOO SIK

Examiner

Lisa A Kilday

Art Unit

2829

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2</u> | 6) <input type="checkbox"/> Other: _____ |

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Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-21 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Wolf, Silicon Processing for the VLSI Era, vol. 1-Process Technology: pp. 164-165, 169-178, 182-4, 194, and vol. 2-Process Integration: pp. 331, 431, 434-5.

The processes taught by the applicant are known as LPCVD, SACVD, PECVD, and APCVD. Wolf discloses the processing temperature (pg. 194), pressure (pg. 169), reactive (pp. 182-4, 194) and inert gases (pg. 164).

In re claims 1 & 14 (and 17, 19-21), Wolf discloses a method for forming a thin film on a semiconductor wafer comprising: heating a process chamber to a steady-state processing temperature; loading a semiconductor wafer (pg. 174 ¶ 4, pg. 172 lines 25-26) into said process chamber; introducing a reactive gas into said process chamber at a preselected pressure (pg. 165); and unloading the semiconductor wafer from said process chamber at said processing temperature (pg. 164 ¶ 1, fig 2, pg. 174 ¶ 4, pg. 175 ¶ 2, pg. 194 table 4, vol. 2: pg. 331 § 5.4.1.3, pg. 431 lines 1-5, pg. 434 § 6.6.2.4).

In re claim 2 with limitations of claim 1 (and 15 with limitations of 14), Wolf discloses that the temperature is between 800-1200°C (pg. 170 lines 23-24, pg. 183 table 2 & lines 19-24, pg. 194 table 4).

Wolf
and
Tauber

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In re claim 3 with limitations of claim 1, Wolf discloses that the temperature is 200-800°C (pg. 169 3rd ¶, pg. 170 lines 23-25, pg. 183 table 2 & lines 19-24, pg. 194 table 4).

In re claim 4 with limitations of claim 1, Wolf discloses that introducing said reactive gas includes introducing an inert gas, wherein said molecular ratio between said reactive gas and said inert gas causes said reactive gas to be at said preselected pressure (pg. 182 lines 30-36, pg. 183 table 2 & lines 19-24, pg. 194 table 4).

In re claim 5 with limitations of claims 4 and 1 (in re claim 15 with limitations of claim 14), Wolf discloses that the pressure of the reactive gas is 0.1-760 Torr (pg. 170 lines 2-3, pg. 173 line 15, pg. 178 lines 1-20 & fig. 12).

In re claim 6 with limitations of claims 4 and 1, Wolf discloses that the inert gases consist of Ar, He, and N₂ (pg. 164 lines 5-10, pg. 194 table 4, eqn. 10, & lines 1-21).

In re claim 7 with limitations of claim 1, Wolf discloses that the pressure of reactive gas is 0.1-760 Torr (pg. 165 lines 9-11, pg. 169 lines 23-25, pg. 170 lines 1-3, pg. 173 lines 14-16, pg. 183 lines 19-20, pg. 184 lines 39-41, pg. 194 lines 1-5).

In re claim 8 with the limitations of claim 1, Wolf discloses that the partial pressure of said process chamber is 0.1-760 Torr (pg. 165 lines 9-11, pg. 169 lines 23-25, pg. 170 lines 1-3, pg. 173 lines 14-16).

In re claim 9 with limitations of claim 1 (in re claim 18 with limitations of claim 14), Wolf discloses that the reactive gas consists of O₂, NH₃, TaETO, NO, N₂O, and H₂O (pg. 183 table 2 & lines 17-32, pg. 184 lines 1-44, pg. 194 table 4 & lines 1-21, vol. 2: pg. 434 § 6.6.2.4 - pg. 435 lines 1-19).

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In re claim 10 with the limitations of claim 1, Wolf discloses diluting said reactive gas with N₂ to reduce the pressure (pg. 164 lines 8-9).

In re claim 11, Wolf discloses a method for forming a thin film on a wafer by heating a process chamber to a steady-state processing temperature; loading a semiconductor wafer into a chamber, said process chamber being under vacuum pressure; introducing a process gas under a pressure into said process chamber; and removing said semiconductor wafer from said process chamber while said process chamber is under vacuum pressure (pg. 164 ¶ 1, fig 2, pg. 174 ¶ 4, pg. 175 ¶ 2, pg. 194 table 4).

In re claim 12 and 13, it has been held that to be entitled to weight in method claims, the recited structure limitations therein must affect the method in a manipulative sense, and not amount to the mere claiming of a use of a particular structure. *Ex parte Pfeiffer*, 1962, C.D. 408 (1961).

Relevant Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Microchip Fabrication, Peter Van Zant discloses the processing temperature, pressure, reactive and inert gases of LPCVD, SACVD, PECVD, and APCVD (pp. 363-393).

Conclusion

Any inquiry concerning this communication from the examiner should be directed to Lisa Kilday whose telephone number is (703) 306-5728. If attempts to reach the

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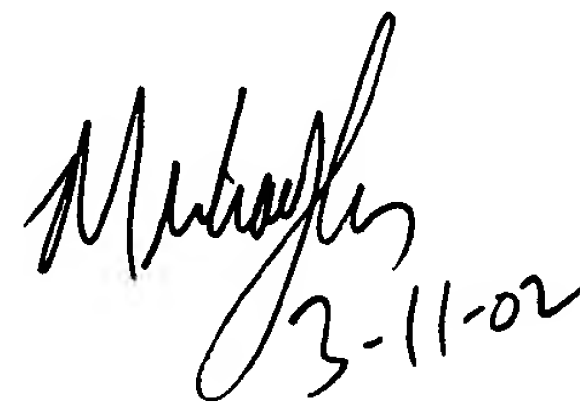
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examiner by telephone are unsuccessful, the examiner's supervisor, Michael Sherry, can be reached on (703) 308-1680. The fax number for the group is (703) 305-3432.

Lisa Kilday

LAK

3/11/02



MICHAEL J. SHERRY
PRIMARY EXAMINER